CLAIMS

1. A method for extracting biological material from a biological cell, the method comprising the steps of:

a) providing a sample chamber and a first and a second electrode, the first and the second electrode and the sample chamber being so positioned that at least a part of the sample chamber is between the first and the second electrode,

b) providing a liquid sample in the sample chamber, which liquid sample comprises a biological cell,

c) exposing said liquid sample to an alternating electric field in said sample chamber, said alternating electric field being provided by the first and the second electrode and having a sufficient amplitude so as to extract biological material from the biological cell, and

d) optionally, performing an analysis on a part of the exposed liquid sample, said part comprising extracted biological material from the biological cell.

2. The method according to claim 1, wherein the first and a second electrode are separated by a distance being at the most 20 mm, preferably being at the most 10 mm, and more preferably being at the most 5 mm.

3. The method according to claim 1, wherein the biological cell is either attached to and/or located between the first and the second electrode.

4. The method according to any of the preceding claims, wherein the frequency of the alternating electric field is at the least 5 kHz, preferably being at least 20 kHz, and more preferably being at least 50 kHz.

5. The method according to claim 4, wherein the frequency of the alternating electric field is at the least 100 kHz, preferably being at least 250 kHz, and more preferably being at least 500 kHz.

6. The method according to any of the preceding claims, wherein the alternating electric field created by modulating the polarity of the first and the second electrode.

7. The method according to any of the preceding claims, wherein the alternating electric field has a substantial form chosen from the group consisting of: rectangular, sinusoidal, saw-tooth, asymmetrical triangular, symmetric triangular; or any combination thereof.

8. The method according to any of the preceding claims, wherein the alternating electric field, in the frequency domain, comprises a least a first and a second frequency component.

9. The method according to any of the preceding claims, wherein the biological material comprises a component selected from the group consisting of a cell organelle, a genetic material, and a protein.

10. The method according to claim 9, wherein the genetic material comprises chromosomal DNA and/or plasmid DNA and/or any type of RNA.

11. The method according to claim 9, wherein the protein is selected from the group consisting of enzymes, structural proteins, transport proteins, ion channels, toxins, hormones, and receptors.

12. The method according to any of the preceding claims, wherein the biological cell is selected from the group consisting of a bacterium, an archaeal bacterium or a eukaryote microorganism, and a eukaryote cell.

13. The method according to claim 12, wherein the bacterium is a spore forming bacterium.

14. The method according to claim 13, wherein the spore forming bacteria are selected from the genus Bacillus and/or the genus Clostridium.

15. The method according to any of the preceding claims wherein the bacterium is from the *Bacillus* group.

16. The method according to claim 15, wherein the bacterium is *Bacillus anthracis*.

17. The method according to any of claims 12-16, wherein the biological cell is a vegetative bacterium, or a spore.

18. A chip for extracting biological material from a biological cell, the chip comprising a sample chamber comprising:

- a sample chamber comprising a first opening in fluid connection with the surrounding air and a second opening to form a fluid connection with a device,
- a first and a second electrode positioned at opposing sides of the sample chamber,
- optionally, the sample chamber furthermore comprising a liquid sample comprise a biological cell, and
- optionally, an alternating electric field between the first and the second electrode, said electric field having a sufficient amplitude so as to extract biological material from a biological cell.

19. The chip according to claim 18, wherein the first and a second electrode are positioned between the first and the second opening.

20. The chip according to claim 18 or 19, wherein the biological cell is located between the first and the second electrode.

21. A device for extracting biological material from a biological cell, the device comprising:

- a chip site where the chip is to be located in order be functionally associated with the device,
- an electrical interface between the device and the chip for applying an alternating electric field between the electrodes of the sample chamber, and
- a programmable unit comprising a software that effects that the device performs one or more actions selected from the group consisting of:

- providing a liquid sample in sample chamber, which liquid sample comprises a biological cell,

- exposing said liquid sample to an alternating electric field in said sample chamber, said alternating electric field having a sufficient amplitude so as to extract biological material from a biological cell, and

- performing an analysis on a part of the exposed liquid sample which part comprises extracted biological material from the biological cell.

22. A system for extracting biological material from a biological cell, the system comprising a chip according to any of claims 18-20 functionally associated with a device according to claim 21.